Name……..Adm No……STREAM……
SCHOOL:……
445/2 METALWORK
PAPER 2
FORM 4
OCT 2022
2½ hours

NYAHOKAKIRA CLUSTER THREE EXAMINATION 2022

Kenya Certificate of Secondary Education (K.C.S.E.)


Instructions to Candidates

(a) Write your name, admission number and class in the spaces provided above.
(b) Students should have the following for this examination;
Drawing instruments;
Scientific calculator;
Drawing paper.
*(c) This paper consists of **two** sections: **A** and **B.***
*(d) Answer **all** the questions in section **A** in the spaces provided.*
*(e)Answer **question 11** on drawing paper and any other **three** questions from section **B** in the spaces provided.*
(f) All dimensions in millimeters unless otherwise stated.
(g) **This paper comprises of 16 printed pages.**
(h) **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**
(i) **Candidates should answer the questions in English.**

For Examiners use only

Section	Question	Maximum Score	Candidate's Score
A	1 - 10	40	
B	11	15	
	12	15	
	13	15	
	14	15	
	15	15	
		Total Score	

SECTION A (40 marks)

*Answer **ALL** questions in this section in the spaces provided.*

1. (a)Define the term "self-employment"**.** ***(1mark)***

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(b) State **TWO** business opportunities in the field of metalwork. ***(1mark)***

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2. (a) State **FOUR** safety precautions to be observed when using a bench shear. ***(2marks)***

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(b) Outline the procedure of locating the centre of a round bar using the scribing block, surface plate and a vee block. ***(2marks)***

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3. (a) State **TWO** advantages of a leg vice over engineer's vice. ***(2marks)***

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(b) State ONE resulting property of alloying steel with each of the following elements: ***(3marks)***

i. manganese

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ii. chromium

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iii. nickel

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4. (a) State **THREE** reasons for finishing metal surfaces. ***(1½marks)***

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(b) Name **THREE** methods of strengthening an edge of a sheet metal. ***(1½marks)***

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5. (a) State **FOUR** factors to consider when choosing the shape of rivet head to use for riveting ***(2marks)***

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(b) (i) State **THREE** reasons why copper is preferred in making head of soldering iron. ***(1½mks)***

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(ii) State **FOUR** differences between soldering and brazing. ***(2marks)***

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6. (a) With the aid of labelled sketches, illustrate the hollowing process. ***(4marks)***

(b) State **THREE** reasons why sheetmetal edges are edge-treated. ***(3marks)***

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7. (a) With the aid of a sketches, outline the steps of punching a hole in a metal bar on an anvil. ***(3marks)***

(b) List **TWO** uses of drift in forging. ***(1mark)***

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8. (a) State **FOUR** factors to consider in order to obtain strong brazed joints. ***(2marks)***

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(b) Outline **FOUR** the difference between the oxygen set and acetylene set in oxy-acetylene equipment. ***(2marks)***

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9. (a) Explain the following faults as applied to gas welding. ***(2marks)***

(i) backfire

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(ii) flashback

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(b) State **TWO** causes of each of the faults in (a) above. ***(2marks)***

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10. (a) State **THREE** effects of using a twist drill with unequal lip angles. ***(1½marks)***

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(b) Differentiate between a clearance fit and an interference fit. ***(1marks)***

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SECTION B (60 marks)

*Answer **question 11** on **A3** paper and any other **three questions** from this section in the spaces provided.*

*Candidates are advised to spend not more than **25 minutes** on this **question 11.***

11. **Figure 1** shows a machined component drawn in isometric projection.

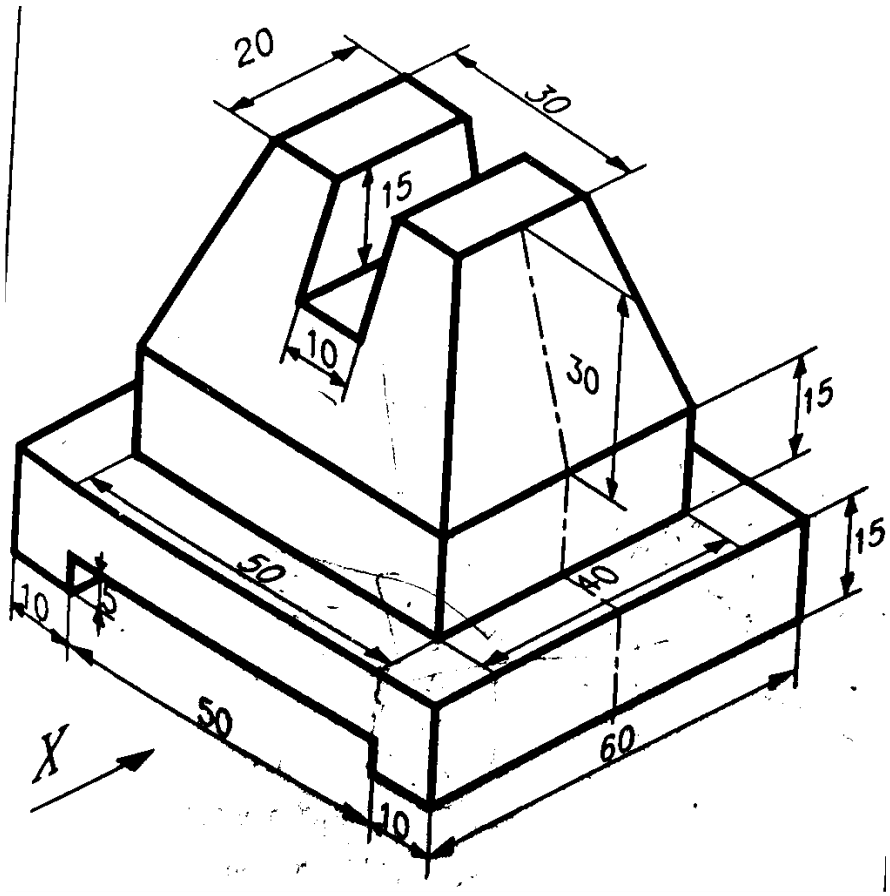

Figure 1

Draw **full size**, the 1st angle of projection;

a) The front elevation in the direction of arrow X
b) The end elevation
c) Plan.

(15marks)

12. (a) Name **THREE** methods of testing the quality of a gas welded joints. ***(1½marks)***

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(b) Sketch the correct flame for welding brass and outline the procedure of setting the flame

(5½marks)

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(c) Use labeled sketches to show an appropriate technique for gas welding thick plates and give **THREE** reasons for using the technique. ***(8marks)***

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13. with reference to arc welding;

(a) Outline the procedure of starting a bead. (10marks)

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(b) With the aid sketches, illustrate **FIVE** welding defects. ***(5marks)***

14. (a) State **TWO** safety precautions to be observed when turning between centres on a lathe machine. ***(2marks)***

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(b) Outline **FOUR** factors which determine the rate of material removal during lathe operations ***(3marks)***

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(c) Outline the procedure of drilling a hole at the end of a round bar on a lathe machine.***(5mks)***

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(d)State **TWO** limitations of using a tthree jaw chuck. (2marks)

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15. (a) State **FOUR** uses of flux when soldering. ***(2marks)***

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(b)With the aid of sketches, state **THREE** types of soldering bit. (3marks)

(c) Outline the procedure of soldering a butt joint. ***(10marks)***

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